HARPALUS FULVICORNIS THUNBERG: A SOUTH AFRICAN CARABID BEETLE ESTABLISHED IN WESTERN AUSTRALIA

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Introduction

As long ago as the early spring of 1959, I collected a series of a medium-sized and apparently unremarkable harpaline carabid beetle from several localities in southwestern Western Australia. In the field, and upon later cursory examination, the specimens passed for a species of the large and difficult native genus *Diaphoromerus* Chaudoir* and they were set aside with other unidentified material of the group. However, upon close study, later, the adhesive tarsal vestiture of the males was seen to be of the biseriately squamose type (Fig. 1), characteristic of the tribe Harpalini, rather than the uniformly spongiose type (Fig. 2) that is found in the Anisodactylini, to which *Diaphoromerus* and most others of the larger Australian Harpalinae belong. At that time, the only known Australian genus of Harpalini was *Phorticosomus* Schaum, where most of some 20 species have secondarily lost the tarsal vestiture, but the Oriental *Coleolissus* Bates has since been recorded (Moore, 1967; Darlington, 1968) in two species, from Cape York Peninsula.

Recourse to modern overseas works dealing with the Harpalinae (e.g., Basilewsky, 1951; Habu, 1973; Lindroth, 1968) led to the conclusion that the Western Australian insect was probably a species of the widespread genus *Harpalus* Latreille and this was supported by direct comparison with material of this genus in my general reference collection, although a specific identification could not be achieved. However it was noted that the species ran most smoothly through keys to the African fauna given by Basilewsky (*op. cit.*) and that, if it could be assumed to have originated in southern Africa, an identification as *H. fulvicornis* Thunberg resulted. Such an identification, in a worldwide genus of over 600 species, was of course highly speculative, in the absence of authentic reference material, and the matter was therefore once more set aside.

Recently, during the course of a visit to London, I took the opportunity to re-examine the problematical Australian harpaline at the British Museum (Natural History) and in a world-fauna context. My specimens were compared with many candidate species from most areas within the geographical range of the genus and including authentic *fulvicornis* (1♂, 2♀♀, Bechuanaland, F. W. Jones, 1907, *det.* Basilewsky), when it became clear that they did indeed belong to that South African species.

The following description and keys are given as an aid to recognition of *H. fulvicornis* within the Australian fauna but in view of the special difficulties associated with the classification of Harpalinae (which is very dependent upon male secondary sexual characters), it should be emphasised that firm identification will normally require direct comparison with authentically determined material. This will be especially the case with isolated female specimens.

*This is now merged with *Notobia* Perty (Noonan, 1976)

Harpalus fulvicornis Thunberg
(Figs 1, 3, 4, 6)

Harpalus fulvicornis Thunberg, 1806, *in* Schönherr, "Synonymia Insectorum", 1: p. 200. Type: Cape.

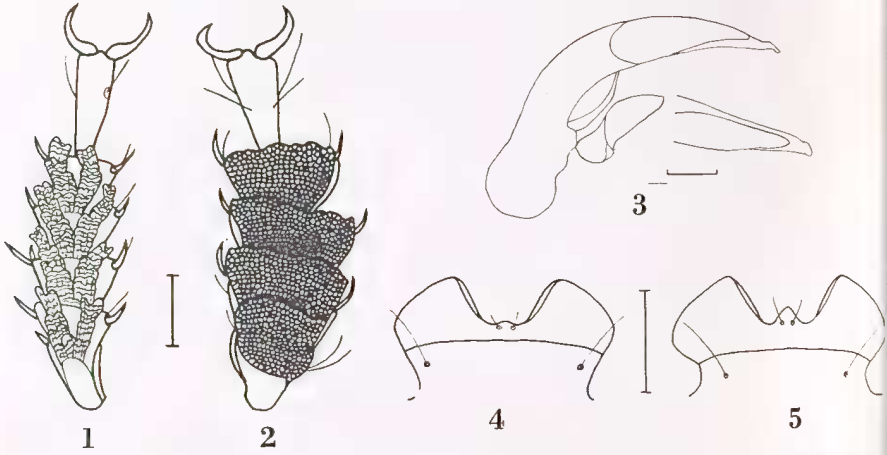
? *Carabus abdominalis* F., 1787, "Mantissa Insectorum", 1: p. 201; 1801, "Systema Eleutheratorum", 1: p. 196. Type: Cape (apparently lost).

Mostly piceous-black, underside lighter in some specimens; upperside, especially the elytra, with bronze reflections; legs ferrugineous; antennae brownish, the basal segment lighter, reddish. Fully winged.

Head of average size for a harpaline (i.e., smaller than in *Phorticosomus* spp.); eyes small, not prominent, lightly enclosed by postocular orbits; mandibles short; median tooth of mentum (Fig. 4) weak; basal segment of labial palpi multisetose on leading edge. Pronotum rather variable in shape but transverse (width/length about 1.45) (Fig. 6); basal impressions feeble, single on each side, punctulate. Elytra rather convex except on disc, striae fine, smooth; intervals nearly flat, finely shagreened in male, more strongly so in female; a short scutellary striole on the second intervals; third intervals with a small pore at the hind quarter (this sometimes wanting). Male anterior and intermediate tarsi lightly expanded, the basal 4 segments biseriately squamose beneath (Fig. 1), those of female simple. Median lobe of aedeagus (Fig. 3) with a weak apical barb. Length: 9-11 mm.

Confirmed Australian records: WESTERN AUSTRALIA, Margaret River, 30.viii.1959, 11 exx (B. P. Moore); Flinders Bay, 30.viii.1959, 2 exx (B. P. Moore), Manjimup, 1.ix.1959, 4 exx (B. P. Moore); Mandura, i.1970, 1 ex. (T. E. Bellas). All specimens from beneath fallen logs in open pastures.

African distribution (*sec.* Basilewsky, *op. cit.*): Orange Free State, Cape Province, Botswana (Bechuanaland).



FIGS 1-5. Carabidae, Harpalinae: (1) male fore tarsal vestiture (squamose type) of *Harpalus fulvicornis* Thunberg; (2) the same (spongiose type) of *Notobia* (*Diaphoromerus*) *germari* (Castelnau); (3) aedeagus of *H. fulvicornis* in left lateral and dorsal views; (4) mentum of *H. fulvicornis*; (5) the same of *N. germari*. Scale-lines 0.5 mm.

KEY FOR THE IDENTIFICATION OF *H. FULVICORNIS* WITHIN THE AUSTRALIAN HARPALINAE

1. Male front and middle tarsi expanded and spongiose beneath 2
- Male front (and sometimes middle) tarsi *either* expanded and biseriately squamose beneath *or* unmodified as in female 3
2. Basal segment of labial palpi bisetose on leading edge . . . . . Pelmatellini
- This segment multisetose . . . . . Anisodactylini
3. Basal segment of labial palpi bisetose on leading edge . . . . . Stenolophini
- This segment multisetose . . . . . Harpalini 4
4. Very robust species; head large; underside markedly hirsute; male tarsi usually unmodified, sometimes weakly squamose beneath . . . . . *Phorticosomus* Schaum
- Less robust; head smaller; underside virtually glabrous; males with front tarsi prominently squamose beneath 5
5. Elytral third intervals multipunctate . . . . . *Coleolissus* Bates
- Elytral third intervals unipunctate or impunctate . . . . . *Harpalus* Latreille (*fulvicornis* Thunberg)

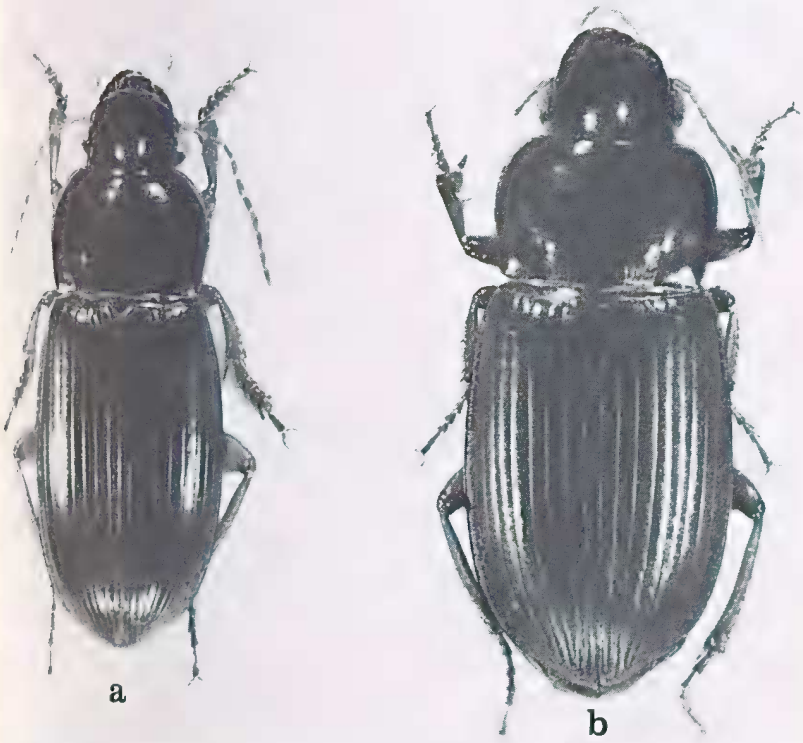


FIG. 6. *Harpalus fulvicornis* Thunberg from Margaret River, W.A.: (a) male; (b) female (natural length 9-11 mm).

Discussion

Although no information is available to indicate how *Harpalus fulvicornis* reached southwestern Australia it seems reasonable to assume that the species

was accidentally imported through the agency of commerce. For although at first sight the occurrence at comparable latitudes on both sides of the southern Indian Ocean might seem to have some zoogeographical significance, this appears most unlikely on closer examination. *Harpalus* is evidently a relatively modern genus, typical of the northern temperate zone, where it is both widespread and rich in species, and it has no near relatives in the older southern harpaline faunas of Australia and South America, where the more primitive tribes, Anisodactylini and Pelmatellini are dominant. Its present occurrence, in a number of species, in southern Africa, may readily be explained as a secondary southward extension, via the East African ranges, of a primarily northern evolutionary line. In support of such an hypothesis, it may be noted that isolated species of the genus are found at middle and higher elevations in those ranges, whereas none is known from the surrounding tropical plains. Any suspicion that *H. fulvicornis* might represent a gondwanian relic in southern Africa and western Australia may therefore be safely dismissed.

The question of a likely time of arrival for the alien species here is also uncertain, although an examination of candidate material in the various state museums might be expected to provide some useful clues. Such a task would, however, likely prove a demanding one, in view of the close level of scrutiny that would be required. Meanwhile, one may speculate that the introduction possibly occurred during the first half of the nineteenth century, when horticultural plant materials were being imported from South Africa on a large scale. The well known Capeweed (*Arctotheca calendula*) was apparently already naturalised in Western Australia by 1833 (Chisholm, 1958) but an animal species might well have taken longer to become firmly established. *H. fulvicornis* was evidently unknown to Sloane when he reported (Sloane, 1898) on a large collection of Carabidae made a few years earlier, in the western State (including the south-western portion) by A. M. Lea—and such a diligent collector as Lea would certainly have taken it had it been as common and widespread as when I discovered it in 1959.

Acknowledgements

I wish to thank the authorities of the British Museum (Natural History) for study facilities and Mr J. Green for the print forming Fig. 4.

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